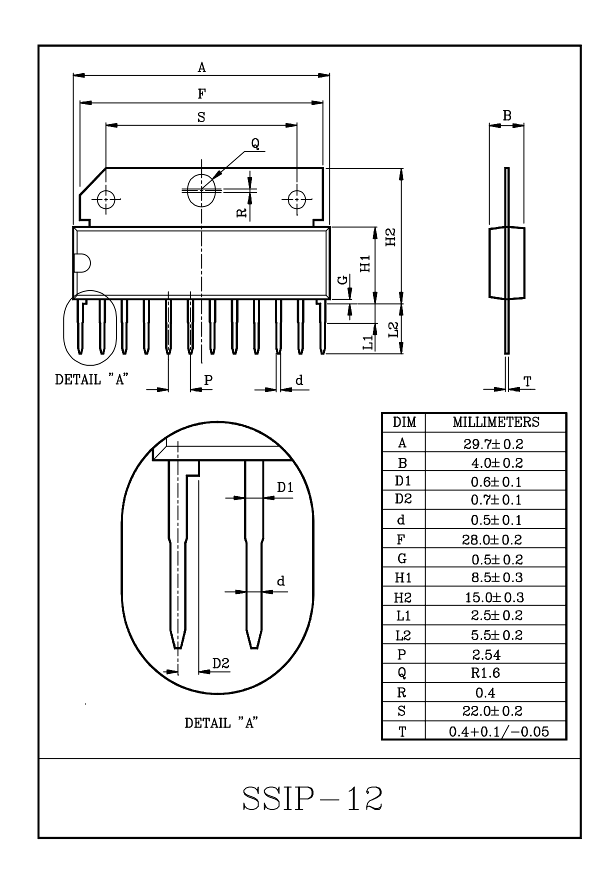
4.6W DUAL AUDIO POWER AMPLIFIER

KIA6283K is an audio power IC with built-in two channels developed for portable radio cassette tape recorder.
Because of the parts reduction and SIP (Single In line Package), space merit is remarkable.
Themal shut down protection circuit is built in.



DIM	MILLIMETERS
A	29.7± 0.2
B	4.0± 0.2
D1	0.6± 0.1
D2	0.7± 0.1
d	0.5± 0.1
F	28.0± 0.2
G	0.5± 0.2
H1	8.5± 0.3
H2	15.0± 0.3
L1	2.5± 0.2
L2	5.5± 0.2
P	2.54
Q	R1.6
R	0.4
S	22.0± 0.2
T	0.4+0.1/−0.05

SSIP−12

FEATURES

- High Power
  P_{OUT}=2.5W/CH (Typ.)
  : (V_{CC}=9V, R_L=4Ω, f=1kHz, THD=10%)
  P_{OUT}=4.6W/CH(Typ.)
  : (V_{CC}=12V, R_L=4Ω, f=1kHz, THD=10%)
- Low popping noise at power ON
- Small Quiescent Current
  : I_{CCQ}=19mA (Typ.) (V_{CC}=9V, V_{IN}=0)
- Soft Clip
- Built-in thermal shut down protection circuit
- Best for supply voltage 9V, 12V
- Operation supply voltage range : V_{CC}=6～15V

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	20	V
Output Current (Peak/CH)	$I_{O(peak)}$	2.5	A
Power Dissipation	P_D	12.5	W
Operating Temperature	T_{opr}	-20～75	℃
Storage Temperature	T_{stg}	-55～150	℃

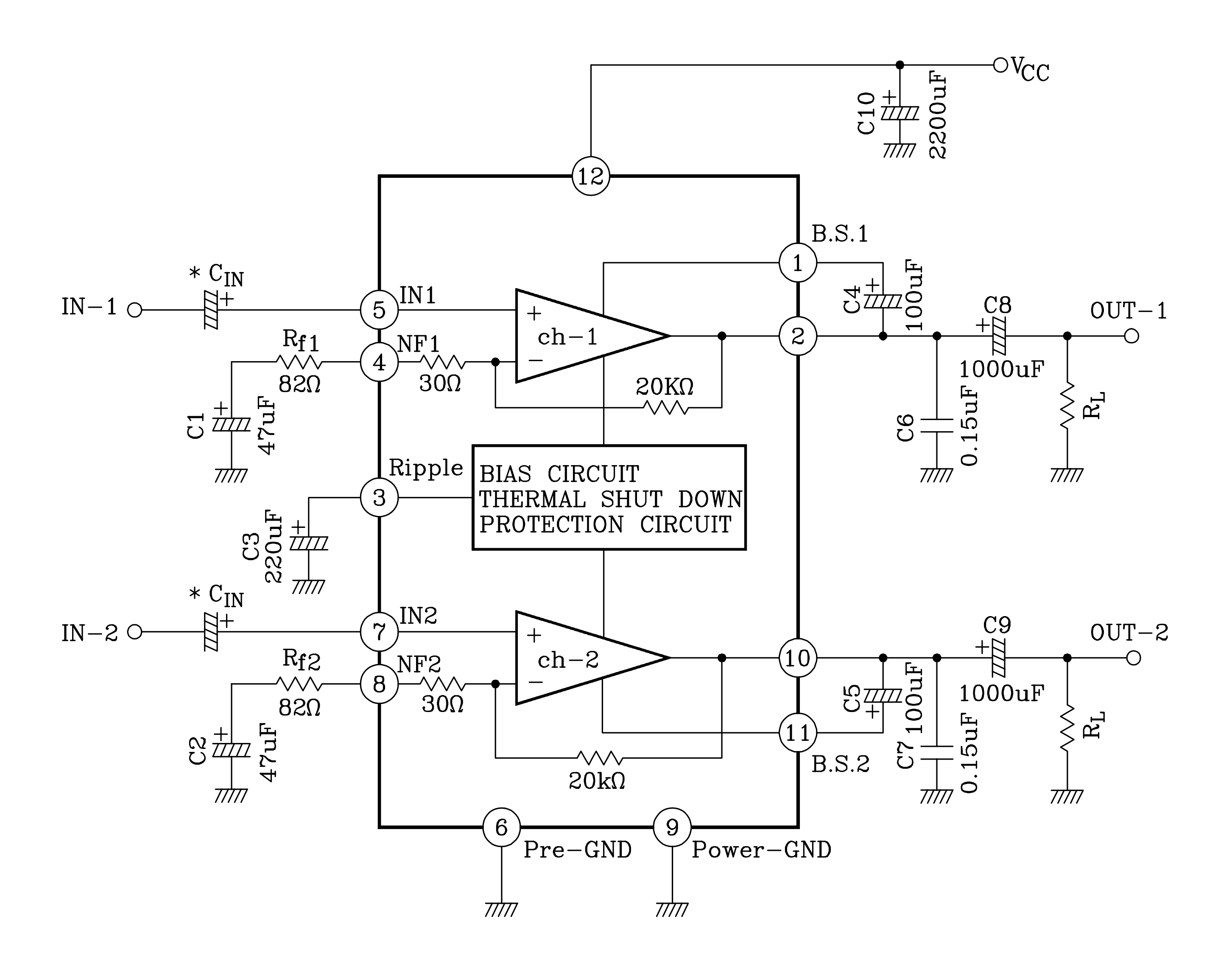
ELECTRICAL CHARACTERISTICS
(Unless otherwise specified, V_{CC}=9V, f=1kHz, Rg=600Ω, R_L=4Ω, Ta=25℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ}	-	V_{IN}=0	-	19	45	mA
Output Power	$P_{OUT}(1)$	-	THD=10%	2.0	2.5	-	W
	$P_{OUT}(2)$	-	THD=10%, V_{CC}=12V	-	4.6	-	
Total Harmonic Distortion	THD	-	P_{OUT}=1W/CH	-	0.2	1.0	%
Voltage Gain	$G_V(1)$	-	Rf=82Ω, V_{OUT}=0dBm	43	45	47	dB
	$G_V(2)$	-	Rf=0, V_{OUT}=0dBm	-	56	-	
Input Resistance	R_{IN}	-	-	-	30	-	kΩ
Output Noise Voltage	V_{NO}	-	Rg=10kΩ, BW=20Hz~20kHz	-	0.3	1.0	mV_{rms}
Ripple Rejection Ratio	R.R	-	Rg=600Ω, V_{RIP}=0.2V_{rms} f_{RIP}=100Hz	-	54	-	dB
Cross Talk	C.T	-	Rg=600Ω, Amp1↔2 V_{OUT}=0dBm, f=1kHz	-	60	-	dB
Input Offset Voltage	V_5,V_7	-	-	-	20	60	mV

TYPICAL DC VOLTAGE OF EACH TERMINAL (V_{CC}=9V, Ta=25℃)

TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12
DC VOTAGE (V)	8.2	4.5	8.9	0.6	0.01	GND	0.01	0.6	GND	4.5	8.2	V_{CC}

TEST CIRCUIT & BLOCK DIAGRAM



* This IC can be used without coupling capacitor (C_{IN}). If volume slide noise occured dy input offset voltage is undesirable, it needs to use the capacitor (C_{IN}).

APPLICATION INFORMATION AND APPLICATION METHOD

1. ADJUSTMENT OF VOLTAGE GAIN

The voltage gain Gv is obtained as follows by R1, R2 and Rf in Fig. 1.

$$Gv=20\ \log \frac{Rf+R1+R2}{Rf+R1}$$

When Rf=0 Gv=56dB(Typ.)
When Rf=82Ω Gv=45dB(Typ.)
By increasing R_f, reduction of Gv is possible. However, since the feedback increase is liable to produce oscillation, it is recommended to use this at 40dB or over.

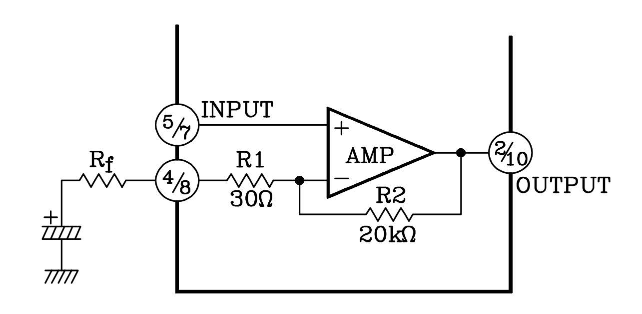


Fig 1.

2. THERMAL SHUT-DOWN CIRCUIT

The thermal shut-down circuit is built in for the purpose of preventing the destruction of IC due to the abnormal temperature rise when the heat radiation is insufficient.
The operation tmperature is set at radiation Fin temperature 175℃(Typ.)
At this temperature or over the bias is interrupted to prevent the destruction of IC.

3. INPUT STAGE

The input circuit of this IC is as shown in Fig. 2.
PNP TR:Q1 is provided in the input circuit so as to make its usage possible without the input coupling capacitor.
However, at pins ⑤ and ⑦, max 60mV offset voltage is produced.
Application after checking volume slide noise is recommended.
For cutting the volume slide noise, insert the input capacitor:C_{IN} in series to interrupt the DC compornent.

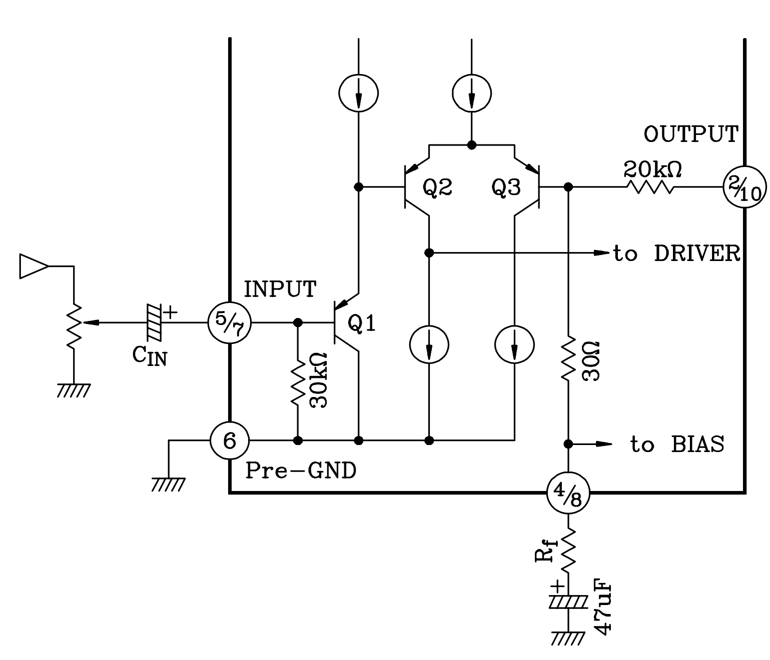


Fig. 2

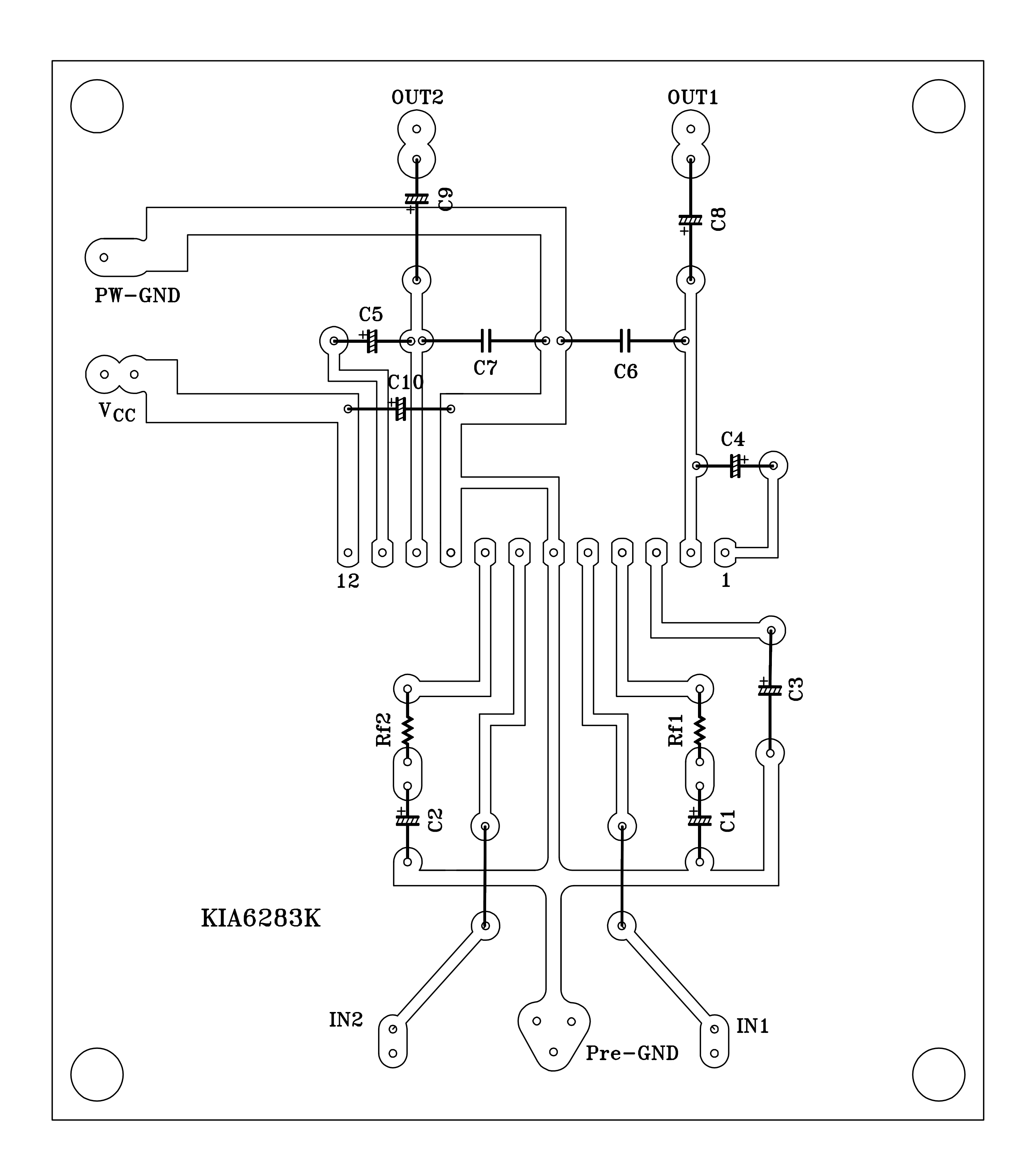
4. OSCILLATION PREVENTIVE MEASURES

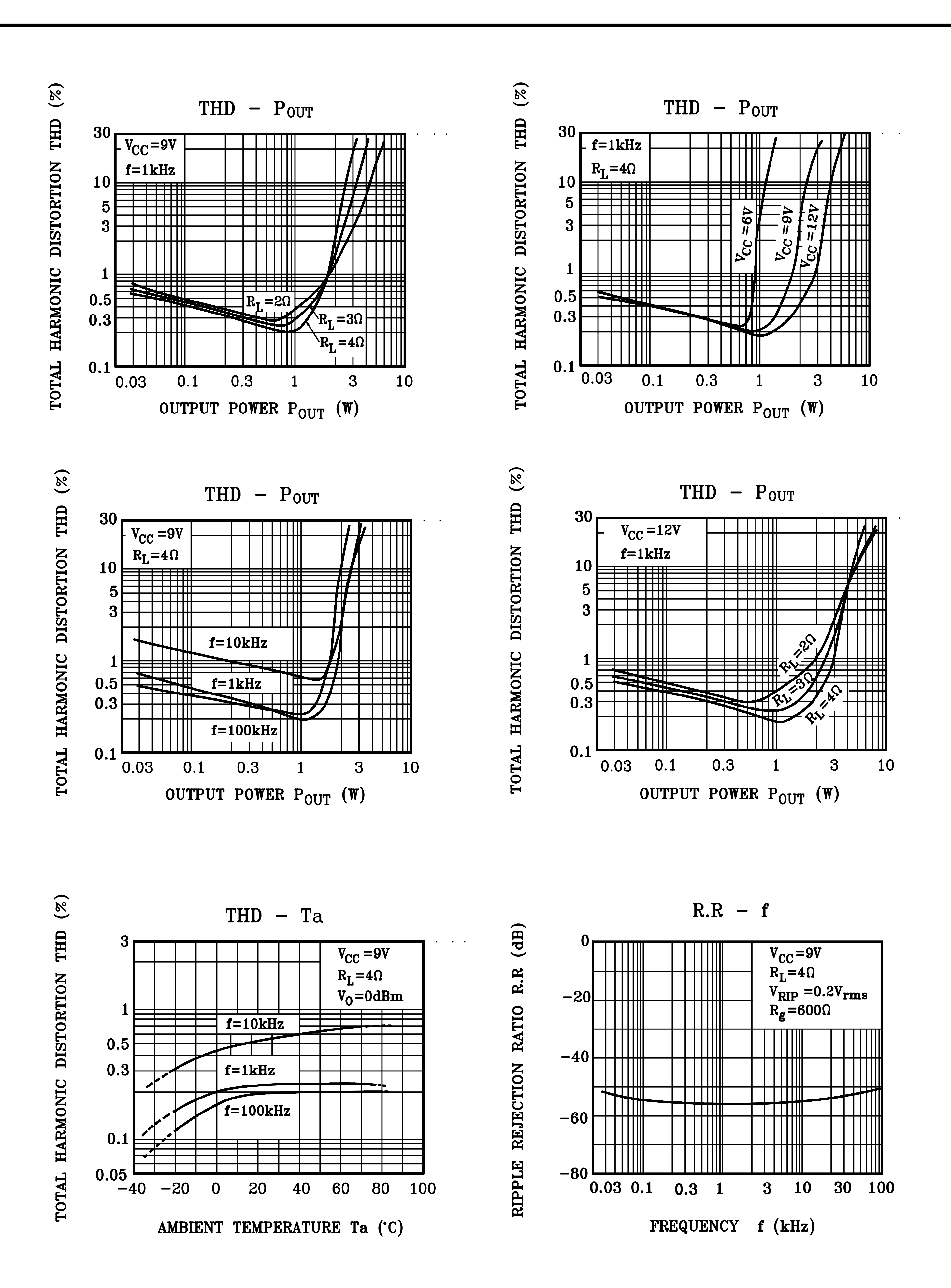
For oscillation preventive capacitor C6 and C7 between the output terminal and GND, it is recommended to use polyester film capacitor having good characteristics for temperature and for high frequency.
Since the characteristics of the capacitor is liable to be influenced by the temperature, use this capacitor after the temperature test to check the oscillation allowance.
In addition, as the position of the electrolytic capacitor has a remarkable influence on the oscillation, connect C10 to V_{CC} at the nearest possible position from power GND.
At using this application with the voltage gain reduced, oscillation is liable to be produced. Apply the capacitor after checking enough for its capacity, type and mounting position.
As the oscillation allowance varies according to the printed pattern layout, the standard printd board of KEC is recommended to be referred to for design it.

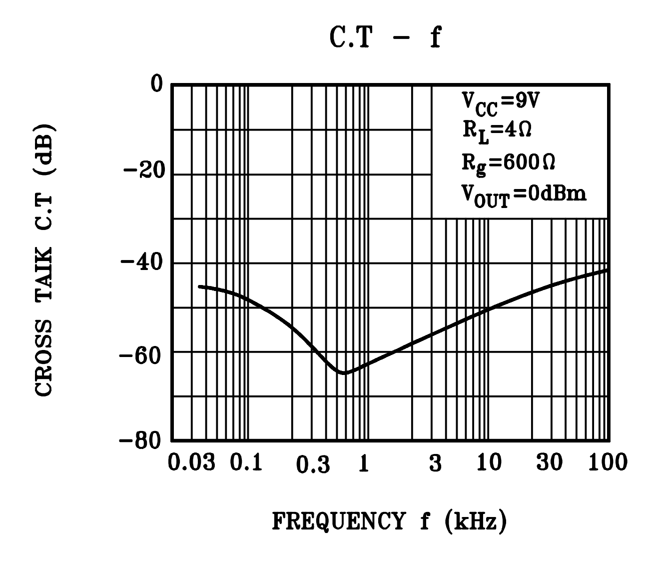
5. INPUT VOLTAGE

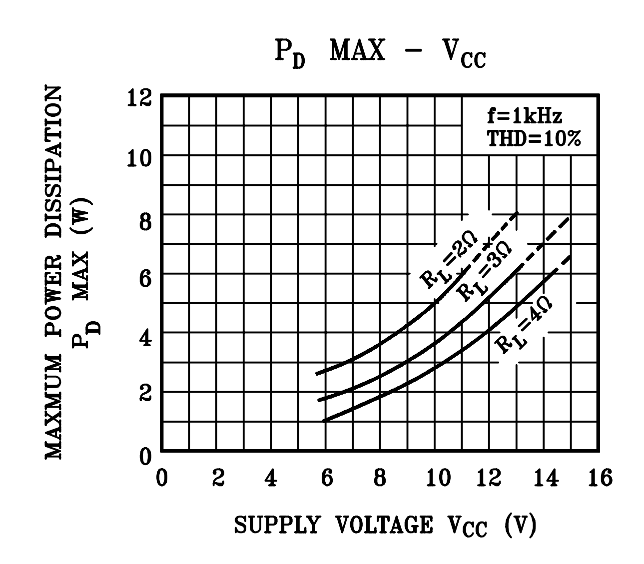
When the excessive signal is input, turning-up is produced in the clip waveform.
The turning-up point is V_{IN}=300mV_{rms}(Typ.) : V_{CC}=9V, R_L=4Ω, f=1kHz : Enough care must be taken for this phenomenon.

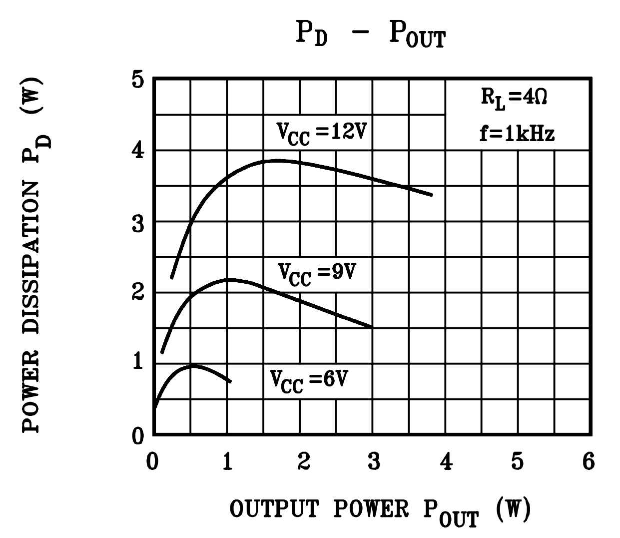
STANDARD PRINT PATTERN

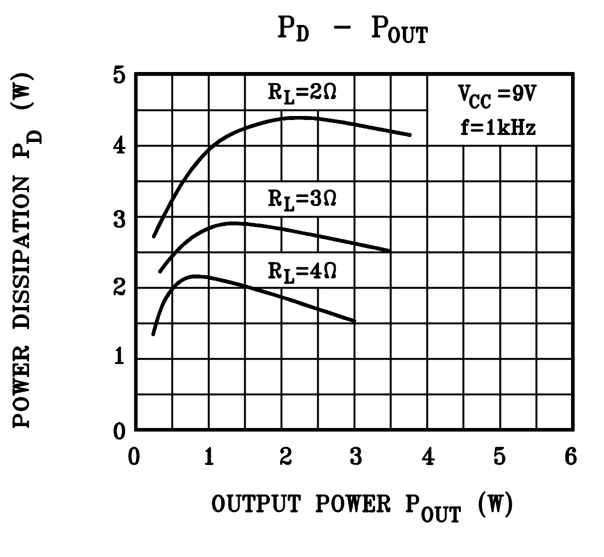


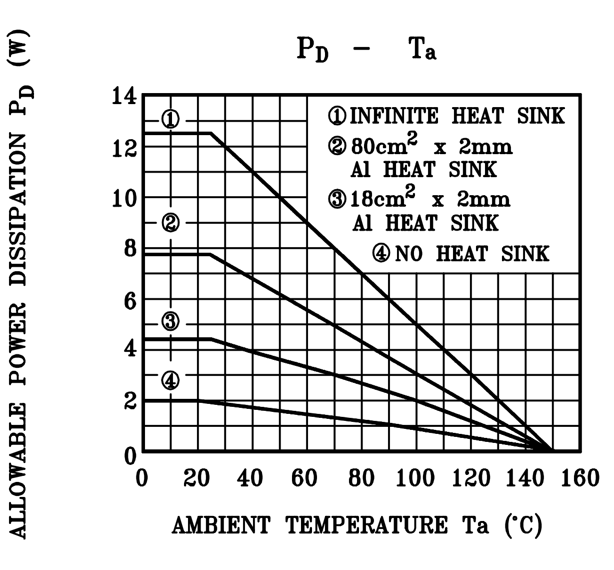

THD – P_{OUT}
V_{CC}=9V
f=1kHz
R_L=2Ω
R_L=3Ω
R_L=4Ω
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT POWER P_{OUT} (W)
THD – P_{OUT}
f=1kHz
R_L=4Ω
V_{CC}=6V
V_{CC}=9V
V_{CC}=12V
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT POWER P_{OUT} (W)
THD – P_{OUT}
V_{CC}=9V
R_L=4Ω
f=10kHz
f=1kHz
f=100kHz
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT POWER P_{OUT} (W)
THD – P_{OUT}
V_{CC}=12V
f=1kHz
R_L=2Ω
R_L=3Ω
R_L=4Ω
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT POWER P_{OUT} (W)
THD – Ta
V_{CC}=9V
R_L=4Ω
V_O=0dBm
f=10kHz
f=1kHz
f=100kHz
TOTAL HARMONIC DISTORTION THD (%)
AMBIENT TEMPERATURE Ta (°C)
R.R – f
V_{CC}=9V
R_L=4Ω
V_{RIP} =0.2V_{rms}
R_g=600Ω
RIPPLE REJECTION RATIO R.R (dB)
FREQUENCY f (kHz)

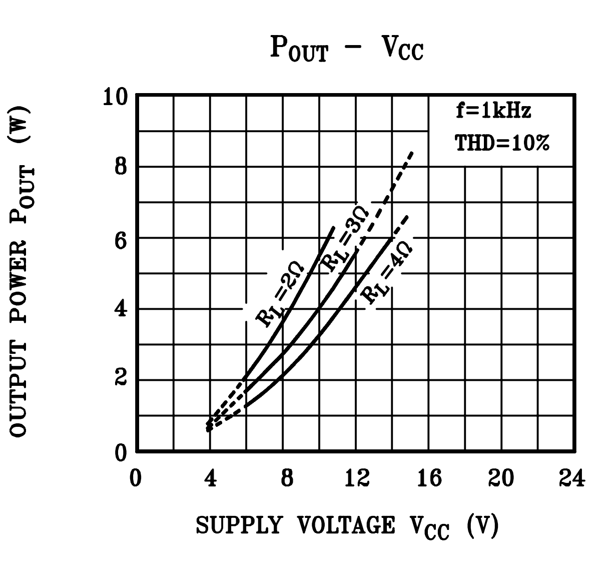

C.T – f
CROSS TAIK C.T (dB)
FREQUENCY f (kHz)
VCC=9V
RL=4Ω
Rg=600Ω
VOUT=0dBm
0
-20
-40
-60
-80
0.03 0.1 0.3 1 3 10 30 100


PD MAX – VCC
MAXMUM POWER DISSIPATION PD MAX (W)
SUPPLY VOLTAGE VCC (V)
f=1kHz
THD=10%
RL=2Ω
RL=3Ω
RL=4Ω
0 2 4 6 8 10 12
0 2 4 6 8 10 12 14 16


PD – POUT
POWER DISSIPATION PD (W)
OUTPUT POWER POUT (W)
RL=4Ω
f=1kHz
VCC=12V
VCC=9V
VCC=6V
0 1 2 3 4 5
0 1 2 3 4 5 6


PD – POUT
POWER DISSIPATION PD (W)
OUTPUT POWER POUT (W)
VCC=9V
f=1kHz
RL=2Ω
RL=3Ω
RL=4Ω
0 1 2 3 4 5
0 1 2 3 4 5 6


PD – Ta
ALLOWABLE POWER DISSIPATION PD (W)
AMBIENT TEMPERATURE Ta (°C)
① INFINITE HEAT SINK
② 80cm2 x 2mm Al HEAT SINK
③ 18cm2 x 2mm Al HEAT SINK
④ NO HEAT SINK
0 2 4 6 8 10 12 14
0 20 40 60 80 100 120 140 160


POUT – VCC
OUTPUT POWER POUT (W)
SUPPLY VOLTAGE VCC (V)
f=1kHz
THD=10%
RL=2Ω
RL=3Ω
RL=4Ω
0 2 4 6 8 10
0 4 8 12 16 20 24